JPRS 78625

29 July 1981

West Europe Report

SCIENCE AND TECHNOLOGY

No. 67

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BRITISH 'SUPER-CHIP' TO REDUCE COST OF ELECTRONIC SYSTEMS

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 23 Jun 81 p 5

[Article: "New Microchip Concept From Ferranti"]

[Text] Frankfurt, 22 June. British Ferranti Electronics has just announced an epoch-making innovation in the production of a new type of "super" chip which will drastically reduce the cost of many electronic systems. If Ferranti is successful with this chip, it will repay many years of expensive development work, reported the FINANCIAL TIMES on 11 June.

The company, a member of the Ferranti group, has concentrated for 10 years on the production of a silicon chip holding a set of standard circuits which can serve as the cornerstone for any customer design. The unassigned logic array (ULA), or gate array, consists of a large number of microscopically small circuit elements such as transistors or diodes which are etched in a standard pattern. Customers can connect these circuit elements in whatever manner is required for the circuit design at hand. This is much cheaper than designing a special chip from the beginning.

In contrast to this, the large American and Japanese semiconductor manufacturers have concentrated on the mass production of standard chips which can be used as basic components of computer logic circuits and memories and for communication equipment. Specially designed chips or unassigned logic arrays are a natural choice where there is a requirement for highly complex circuits in a small package, as in camera controls for example. Such circuits have been neglected by the large American and Japanese semiconductor manufacturers who preferred to market large numbers of inexpensive standard chips.

Ferranti Electronics and its American subsidiary, Interdesign, in Sunnyvale, California, are thinking in terms of worldwide leadership with a 30-percent share of the market in unassigned logic arrays. People in the industry believe that these chips will be among the dominant technologies of the 1980's. The market volume is projected to be $20 million toward the end of the decade.

Ferranti will distribute more than 20 types of unassigned logic arrays and has now also announced a new manufacturing process called FAB 2 which can package many more circuit elements on a chip.

9160
CSO: 3102/316

BRIEFS

AGREEMENT ON BUBBLE MEMORIES--National Semiconductor and SAGEM S.A., Paris have signed a second-supplier agreement dealing with development, manufacturing and distribution of 256-kbit and 1-Mbit bubble memories (magnetic bubble memories). The production of the SAGEM version, which is compatible with National's NBM 2256, will begin in mid-1981. SAGEM has been involved with bubble-memory development since 1976. The company's production program includes data systems, navigation systems, special equipment--for the Airbus, for example--and numerical controls. National Semiconductor is the producer of integrated circuits, including microprocessors, as well as linear, digital and interface circuits. Their production program also includes IBM-compatible computer systems. [Text] [Munich REGELUNGSTECHNISCHE PRAXIS in German Apr 81 p 118] 9160

CSO: 3102/316

FIRST FRENCH SOLAR POWER PLANT TO FUNCTION IN SEPTEMBER

Paris LE MATIN in French 20 Jun 81 p 18

[Article by Francois de Muizon: "The Solar Plant to Start Operation in September"]

[Text] THEMIS, the first French solar plant set up at Targassonne (Pyrennees-Orientales), will start operation in September. It is primarily a prototype, a tool intended to help research on thermal power plants and to study new components (transducers, heliostats, turbines). It is a "showcase" intended for developing countries which cannot afford or adapt to nuclear technology. Contested in its very principle, even by some ecologists who promote a "lighter" and more decentralized use of solar techniques, THEMIS was close to never being born: work was suddenly stopped in May 1979, as the result of a decision which had become symbolic, and was subsequently repealed under pressure from the public at large.

Targassonne is a small village in the Pyrennees-Orientales district of south-western France, at 6000 feet altitude. On the slopes, in tight rows, are 200 53,7 m^2 solar reflectors arranged into a sort of amphitheater to pick up the sun's rays and make them converge on an "oven" located at the top of a 100-meter tower. A mixture of sodium and potassium nitrate and nitrate with a flow-rate of 3 kg per second is brought to a temperature of 450°C. These salts are placed in contact with water on their way down the tower. The steam thus produced is fed into a 2500 kW turbo-alternator which produces electricity. Such is the operating schematic of one of the three largest solar power plants in construction in the world, THEMIS, the child of the EDF (French Electrical Company) and the CNRS (National Center for Scientific Research), whose work is nearing completion as the operating date of September draws near.

At noon in June, in the best sun conditions, THEMIS picks up 11 MW of solar energy to produce 2.3 MW of electricity. Yearly production is expected to be 3 million kWh, or the equivalent of the electrical needs of a city of 2,500 people. THEMIS will cost 128 million francs, and depreciation is planned over a 20-year period, which brings the price of one kWh to 5 F (about $1.00), or six times more than gas.

But THEMIS is an experimental prototype plant: it hosts the National Center for Solar Experimentation, and it cannot be compared commercially with other sources of energy. The price of heliostats (3,000 francs per m^2) is heavy on THEMIS' budget. Moreover, the technique being used: light and complex mechanical

structures supporting panels made up of two sheets of glass, one of them 2 mm thick, separated by a silver-coating, is questioned by experts. Considerable expenses have been invested to automate the tracking of the sun by the panels which must project the sun's rays at more than 100 m to the oven.

Steam return to the atmosphere is not considered: a "dry air-coolant" is to be tried at Targassonne. It consists of an enormous radiator made up of quadrangle-shaped metallic structures 30 m high where steam will be condensed at the output from the turbo-alternator. If the experiment is successful, the EDF is considering using this equipment in nuclear reactors. On the other hand, the cost of the salt is negligible. A 535-ton load costing 10 million francs is required at the start. Its life is the same as that of the plant. Finally, THEMIS is dependent completely upon the sun. At Targassonne, experts count upon good sun availability, but wind may be detrimental to the plant's operation: at wind speeds over 50 kmh, the heliostats must be located face down or run the risk of being damaged. This is a handicap.

"For us, the THEMIS type direct solar convection method may not be the optimal solution and we are not certain today to be able to reduce the costs by a factor of 2 or 3, which would be the only way to give this technique a future," says Marcel Fagot, Director of the Equipment Agency for the Alpes-Marseilles region.

On the other hand, in certain regions of the world with good sun availability, and where transportation of energy is a large part of electricity costs, such as in Australia, THEMIS type solutions may be interesting, especially since cost reductions may be effected in several areas. For instance, new types of panels manufactured at a cost lower than in THEMIS have appeared on the market since the construction of the plant. A cheaper type of oven than the one used in the Targassonne plant is also available now. Finally, the automatic operation of the plant will be fine-tuned progressively, which will reduce costs.

6445
CSO: 3102/318

FRANCE CONSIDERS COAL CONVERSION FOR ENERGY DIVERSIFICATION

Paris L'USINE NOUVELLE in French 4 Jun 81 pp 75-77

[Text] While the speeches dealing with gasification in France are now innumerable, it is still quite difficult to know what our status is in this area. L'USINE NOUVELLE takes inventory of the opposing forces and deals with the stakes, plans or studies now in progress.

Ex situ gasification of coal in France, which raises economic, technical and political problems, constitutes the very type of tricky case which needs to be approached carefully. Its complexity is derived from the number of participants and the diversity of their motivations as well as the multiplicity of channels and processes and, of course, the size of the investments to be placed.

Nevertheless, while it is a certainty in this area, it is incontestable that France has fallen behind considerably (due to the decline in its coal production) with respect to countries such as the United States, Germany or Great Britain (all big producers of coal) which have devoted substantial resources to the development and improvement of gasification channels and processes, some of which are already in the industrial phase.

Therefore, when, after occurrence of the two petroleum industry shocks, France was faced with the question of employing coal as a means of diversification of energy sources, there remained (except for direct use of coal in boilers) only one solution for development of gasification, namely, acquiring the license for one of the processes which had been proven abroad, even if it had to be adapted to the conditions peculiar to the French market. Nevertheless, 3 years after this petitio principii, no process has yet been selected.

This dilatoriness is conceivably due to the extreme diversity of and the often divergent motivations of the interested parties. The leader of these is Gaz de France whose medium-term (perhaps long-term?) objective is still the production from imported coal of subetitute natural gas (SNG), intended to be, due to its high heat-producing capacity (9 thermal units per cubic meter), injected into the distribution system. However, the short-term goal is to begin by producing gas with a medium heating capacity (3 thermal units per cubic meter), intended for factories located near the gasification plant (within a radius of 20 to 30 kilometers) or else to be diluted to 10 percent of its initial strength and then injected into the distribution system. In any case, the objective is to minimize possible problems of supply of natural gas and, above all, the inevitable increases in price.

Next in importance come the chemical firms, particularly CdF-Chimie, which is the biggest producer of ammonia and methanol in France. Its interest in gasification techniques becomes obvious when it is learned that these two basic chemical products, which are now manufactured from methane (10 percent of French consumption), could just as well be made from synthetic gas and that CdF also happens to produce coal in Lorraine (10.5 million metric tons per year).

The third group consists of petroleum companies which are interested in gasification for three reasons. Firstly, they want to treat residues of very heavy crude oils (coke). Then, in connection with the carburol program, they would like to manufacture methanol to be mixed with gasoline. Finally, simply for diversification in connection with a coal policy that would combine the source (purchase of mines) with the supply (direct or indirect use of coal).

In addition to Charbonnages de France, which believes that it has something to say on this matter and which is consulted on technical phases, we should also mention the engineering firms and big equipment manufacturers (Technip, Creusot-Loire, Heurtey, etc.) which parade all of their know-how and talents of persuasion for the purpose of capturing large markets. A plant that consumes 1000 metric tons of coal per day is worth 1 billion francs!

Finally, last but not least, public authorities, who are solicited by everyone in their role of providers of funds, have displayed a mitigated position in this area. Thus, they have never hidden the fact that direct use of coal (in boilers, for fuel oil-coal mixtures, fluidized beds) was considered by them to be better suited for industrial use while only certain aspects of gasification were considered for the manufacture of methanol fuel (with regard to carburol).

The second reason for hesitation is the diversity of techniques. Without going into detail (see the table below), it should be pointed out that of the dozen or so existing processes, only three have been marketed after having been subjected to industrial testing. These are the so-called first generation processes (Lurgi, Koppers, Winkler) which were developed in Germany before and during the war. Using the reaction of a mixture of oxygen and water vapor with coal, they produce a gas of industrial quality. Their efficiency is low (50 to 65 percent). Other processes of the second generation--(Texaco, Shell Koppers, Saarbert Otto) have nearly completed their development phase. Operating at high temperatures, they eliminate tars and phenols and have an efficiency of 75 percent. Finally, there exists a whole string of processes for use in the future, including the Lurgi ash fusion process developed by the British Gas Council, the U-Gas process of the Institute of Technology of Chicago and a second generation Winkler process.

Following are the French projects:

The project tabled by Gaz de France: At first, CdF awarded study contracts to various engineering firms for the construction of a gasification unit with a capacity of 1000 metric tons per day to be placed in service around 1984 or 1985 and intended to produce 300 million cubic meters of industrial gas per year. Thus, Creusot-Loire was merged with Texaco, Technip with Winkler, Loire Entreprise with Lurgi, etc., although, in certain cases, these were only mergers of convenience (see box). As for the Shell Koppers project, it was not retained since it would not be for sale for 5 years. The projects are to be resubmitted

within 2 months and the decision is to be made by the end of the summer. Although the site has not yet been chosen officially, it is already reasonable to assume that it will be Le Havre. Texaco is the initial favorite but Lurgi has many industrial recommendations. The financial factor will be the determining one. In the second phase, GdF plans the construction of a unit ten times the size for the manufacture of SNG. "At the present time," confessed Pottier, in charge of the mission in the research administration of Gaz de France, "we have encountered methanization problems since the catalysts cannot withstand impurities in the gas." This is why GdF, in conjunction with IFP at Alfortville, is studying means of solving these problems. Nevertheless, the fact remains that the final figure for efficiency does not exceed 45 percent and that the price of SNG obtained by means of this process is far from being competitive with that of natural gas.

The two studies conducted by CdF-Chimie: A feasibility study is being carried on for the construction of a plant (capacity of 1000 metric tons per day) for the manufacture of ammonia at Mazingarbe, intended to replace a former plant operating half on natural gas and half on coking plant gas. Several processes are being considered but Marcel Bohy, in charge of the mission in the research administration of CdF-Chimie, does not hide the fact that he favors Lurgi, saying "Lurgi is the only plan that has been fully developed."

Furthermore, at the request of public officials, a study is being conducted for a plant (2500 metric tons of coal) to manufacture methanol (1500 metric tons per day) at Carling. According to CdF-Chimie, it appears that "the Texaco process has the inside track," but it is also conceivable that the two Lurgi and Texaco reactors will be coupled, thus making it possible to employ both coal pieces and fines.

Ideas furnished by oilmen: A research and development program is now being studied with regard to the Texaco process (Creusot-Loire is in charge) bringing together CRF, Elf, GdF and IFP. Nevertheless, no decision will be made before September with regard to this pilot plant which has a capacity of 50 metric tons per day. The board of directors was consulted but has not yet rendered its decision. However, selection of the site has proved to be a delicate matter since Elf prefers Solaize and CFR has opted for Le Havre.

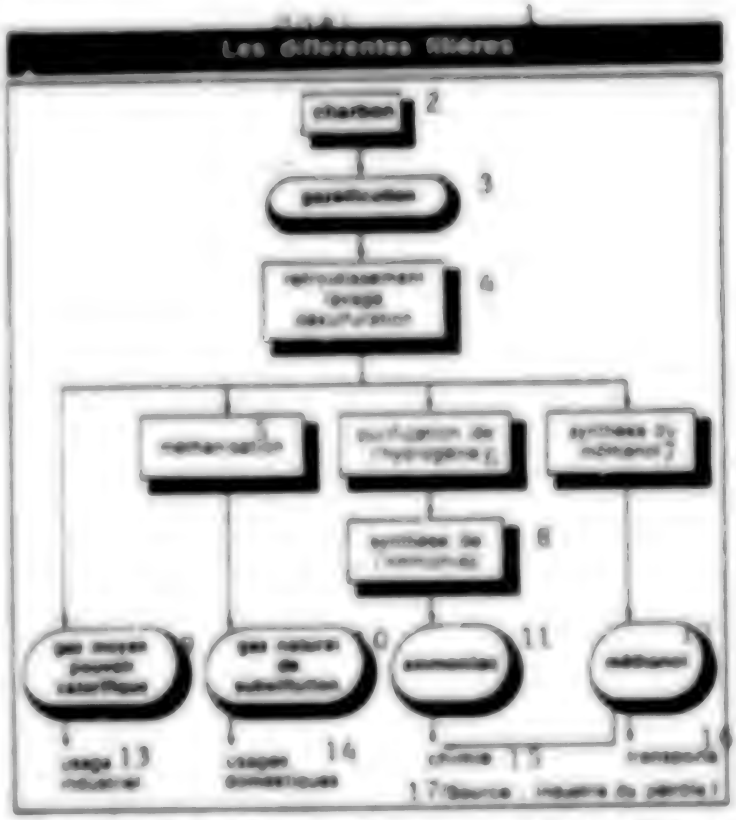
No Lack of Ideas

Furthermore, both companies are working on their own projects (perhaps at Le Havre and Donges), although these are being kept "top secret." Nevertheless, it is known that Technip is conducting two studies on methanol for the oil companies. It can be seen that there is no dearth of ideas even though feasibility studies outnumber firm projects. If there is a delay in construction, this is due to the fact that the problem of competitiveness with respect to traditional sources of energy still remains. According to Jean Pottier of GdF "A gasification plant that would begin operations today would not be profitable. The ratio between gas obtained and heavy fuel is 1.5." Furthermore, the magnitude of investment required is a deterrent factor. This is why the future of coal gasification in France will depend on the attitude of the new government.

Bug: The Texaco Case

The American Texaco process is intriguing to the French but its principal drawback is that it only exists as a pilot plant form in the United States. Since it is derived from petroleum techniques, it is favored by the oil companies. As for Creusot-Loire, it has installed itself as the herald of the process by proposing to adapt it to French conditions. However, this does not necessarily mean that it will enjoy a monopoly with regard to this process.

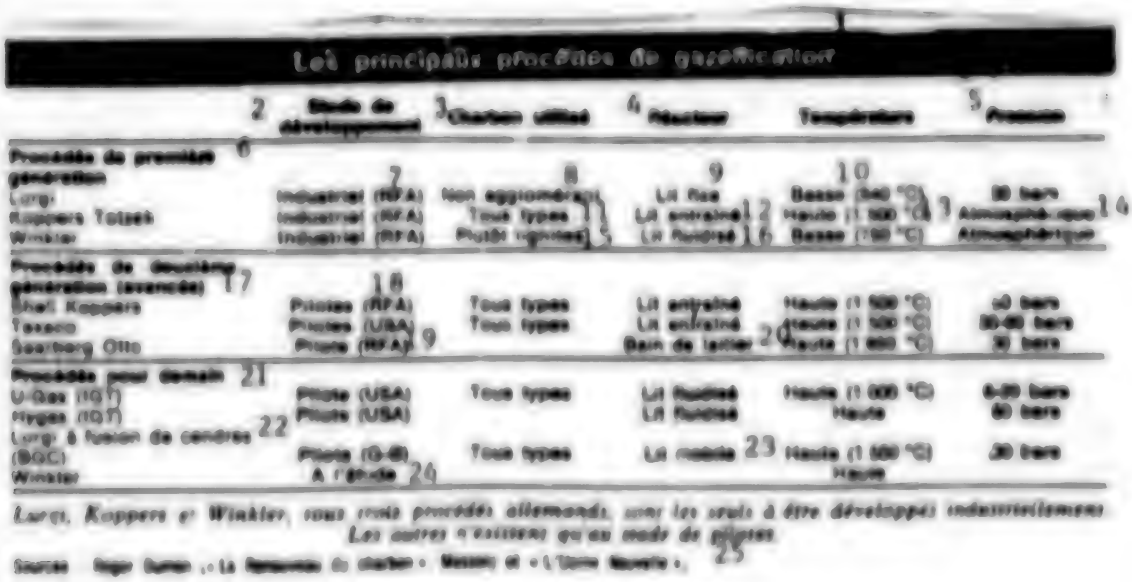
Thus, Technip, merged by GDF with Winkler to meet the requirements of studies preliminary to construction of the first gasification plant, is working on other processes in addition to the Texaco process. "At the present time we have two people working with Texaco in the United States and we have already seen several study contracts awarded to France for the manufacture of methanol by this process" says Adrien Aroulay, Director of the Chemistry Department at Technip. Although it is attractive from many points of view (guarantee of coal injection, low pollution level, high efficiency, flexibility of use), the Texaco process poses several high temperature problems (resistance of refractories, cooling jackets, recovery of output heat) as in the case of coal. However, insists Creusot-Loire "Since the Shell Koppers process is not for sale and since Saarberg and Lurgi are only associates, it is the only one (Texaco does not prescribe any particular builder) to work on a process which is not perfect."



Les voies de la gazéification sont prometteuses. De la production de gaz industriel au méthanol, en passant par le GNS et l'ammoniac, elle constitue un moyen de diversification énergétique non négligeable.

1. The various channels.
2. Coal.
3. Gasification.
4. Cooling, washing, desulfurization.
5. Methanization.
6. Purification of hydrogen.
7. Synthesis of methanol.
8. Synthesis of ammonia.
9. Medium heat output gas.
10. Substitute natural gas.
11. Ammonia.
12. Methanol.
13. Industrial use.
14. Domestic uses.
15. Chemistry.
16. Transportation.
17. Source: Industrie du Petrole.
18. The gasification subprocesses are promising. From conversion of industrial gas to methanol, including SNG and ammonia, it constitutes a significant means of energy diversification.

Lurgi, Koppers and Winkler, all three of them German processes, are the only ones to have been developed industrially. The others exist only in the form of pilot plants.



Les principaux procédés de gazéification

	2 Stade de développement	3 Charbon utilisé	4 Réacteur	Température	5 Pression
6 Procédés de première génération					
Lurgi	Industriel (RFA)	Non agglomérés	Lit fixe	Basse (540 °C)	30 bars
Koppers Totzek	Industriel (RFA)	Tous types 11	Lit entraîné 12	Haute (1 500 °C) 13	Atmosphérique 14
Winkler	Industriel (RFA)	Plutôt lignites 15	Lit fluidisé 16	Basse (760 °C)	Atmosphérique
Procédés de deuxième génération (avancés) 17	18				
Shell Koppers	Pilotes (RFA)	Tous types	Lit entraîné	Haute (1 500 °C)	40 bars
Texaco	Pilotes (USA)	Tous types	Lit entraîné	Haute (1 500 °C)	30-80 bars
Saarberg Otto	Pilote (RFA) 19		Bain de laitier 20	Haute (1 800 °C)	30 bars
Procédés pour demain 21					
U-Gas (IGT)	Pilote (USA)	Tous types	Lit fluidisé	Haute (1 000 °C)	6-20 bars
Hygas (IGT)	Pilote (USA)		Lit fluidisé	Haute	80 bars
Lurgi à fusion de cendres (BGC)	Pilote (G-B)	Tous types	Lit mobile 23	Haute (1 600 °C)	20 bars
Winkler	A l'étude 24			Haute	

Lurgi, Koppers et Winkler, sont seuls procédés allemands, sont les seuls à être développés industriellement. Les autres n'existent qu'au stade de pilotes.

Sources : Roger Dumon, « Le Renouveau du charbon » Masson et « L'Usine Nouvelle ». 25

1. The principal gasification processes.
2. Stage of development.
3. Type of coal used.
4. Type of reactor.
5. Pressure.
6. First generation processes.
7. Industrial plants (West Germany).
8. Non-binding.
9. Fixed bed.
10. Low.
11. All types.
12. Driven bed.
13. High.
14. Atmospheric.
15. Generally lignite.
16. Fluidized bed.
17. Second generation (advanced) processes.
18. Pilot plants (West Germany).
19. Pilot plant (West Germany).
20. Slag bath.
21. Future processes.
22. Lurgi ash fusion process.
23. Mobile bed.
24. Under study.
25. Sources: Roger Dumon ("Le Renouveau du Charbon," Masson) and "L'Usine Nouvelle."

7619
CSO: 3102/313

COMPANIES IN RACE TO MARKET COAL-WATER FUEL FIRST

Stockholm SVENSKA DAGBLADET in Swedish 28 Jun 81 p 26

[Article by Bosse Pettersson]

[Text] Let us have liquid carbon warm up Sweden! This is going to be the slogan when Nynas and Boliden are in a race to market a new fuel.

The large companies have invested tens of millions in the development of a functional purified coal-water mixture. The important point is that it can be used in the existing oil burners and will not require purification of the exhaust air. The oil distribution network can also be used for the transporting of this fuel.

Two companies are in a race to be the first one to market the fuel. One of these, Carbogel, is owned by Boliden and the inventor company Scaniainventor in Helsingborg. Nynas Petroleum, Granges Hedlund and Cementa are behind the other company, Nycol.

The companies do not question that there is going to be a breakthrough. It may take 6 months to 2 years before it will be sold commercially.

Managing Director of Nycol States: "We Are Partners"

Neither Carbogel nor Nycol want to acknowledge that there would be a race between the two of them. Both parties also emphasize that they know very little about what the other one is doing. Despite the indifferent attitude Torsten Lundstrom, Boliden's project leader for Carbogel, admits: "It is very important to be first on the market."

Lars Rey, managing director of Nycol:

"I am not being a hypocrite when I say that I consider Carbogel rather as a partner than as a competitor. It is good for the customers to have several suppliers."

Carbogel was started already in 1973-74 and some time ago the project of developing a 70 percent coal and 30 percent water mixture was started. Combustion experiments are being performed at, among others, the Boliden lead foundry at Helsingborg. Nycol was not started until this fall. It is now relying on imported American technology in order to catch up. The production will start in the beginning of

August in the factory that Cementa recently shut down in Stora Vika off Nynashamn. Almost the entire cement production equipment can be used: mills, cisterns, etc. That makes it possible to quickly build out the production.

"It is possible that it will be Carbogel that sells the first tons," says Lars Rey. "But they will not be ahead of us on a large scale."

Landskrona Possible Location of Carbogel Factory

Lars Rey believes that Nycol will produce 700,000 tons in 1983. Torsten Lundstrom is more cautious. His prognosis is: "Some 100,000 tons in 1983-84." A production of that size requires investments in the 100 million range. A new factory is required for Carbogel. Its location may be Landskrona, in case there will be a coal harbor.

Neither one of the companies is afraid of expanding too much. Torsten Lundstrom believes in a future market of 10 million tons per year. One of the goals is the district heating plants. There are about 70 such plants that were built at about the same time and all of them are in the same economic situation. All of them would be eager to use a fuel that could be used in the oil burners after a minor reconstruction.

The industries are other possible buyers. It is, however, disputable that liquid fuel would be an alternative for the largest power plants.

9662
CSO: 3102/319

FRAUNHOFER INSTITUTE STUDIES DESIGN OF ASSEMBLY ROBOTS

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 19 Jun 81 p 1

[One of a series of articles on industrial automation by Hellmut Droscha: "Industrial Robots Learn, See and Feel"]

[Text] Frankfurt, 18 June--In the area of handling and assembly, it is frequently asked whether a special machine or a robot is more advantageous with regard to reprograming. The Fraunhofer Institute for Production Engineering and Automation (IPA) (see also BLICK DURCH DIE WIRTSCHAFT of 16 June) has determined that in the case of a special machine only about 20 percent of its hardware is reuseable and 80 percent must be scrapped while in the case of robots it is approximately the reverse.

The IPA also investigated another completely different question: What all is involved from the standpoint of design to fashion an intermediate or an end product so that it is suitable for handling, or in a broader sense so that it is suitable for automation? It was shown that assembly is simplified when the motions required for joining parts--assembly motions, in the language of the trade--involve the smallest possible number of degrees of freedom, for example longitudinal motions, transverse motions and turning motions to the left or right. Snap joints in the sense of spring-loaded detents are very good. The parts or work pieces must be easy to load into and remove from magazines. It is very expedient to design parts so that they can be put together as subassemblies, for example automobile engine and steering system assemblies. New joining methods--bonding, for example--offer great advantages. The preceding recommendation by no means exhaust IPA's list.

In mass production, mechanical assembly starts with small parts usually vended as bulk goods from supply bins. The general trend is toward larger bins which have to be refilled less often, with productivity gains from mechanized separation of parts using vibrating conveyors. In the area of vibratory sorting devices, one manufacturer, Rhein-Nadel Automation, has developed a new compact device, a mobile sorting-bin floor which is not attached to the oscillating mass but is carried on a base plate. This device represents an improvement with respect to the smooth flow of parts, noise reduction and protection of parts. But quite apart from this, it is also an improvement for storing, ordering, transporting, sorting and positioning of parts for which the oscillatory conveyor is not well suited, often due to adverse operating conditions.

In this case, the parts are also dumped disordered into a deep bin. They are then moved up to machine level by two stepless-control-equipped tandem conveyors, the second of which climbs with respect to the first. At machine level an ordering and presenting unit, which can be adapted to parts of varying shape by adjusting or removing and replacing certain of its parts, completes the ordering and sorting of parts which was begun on the bin conveyor.

IPA has developed a small installation for ordering and magazining of small to medium quantities of binned parts. It is controlled by several synchronized microprocessors of various types. The conversion associated with changing from one type of workpiece to another is completed in less than an hour and requires for its initiation--if the shape of the part is not too complex--only the call up of a new program. No mechanical changes are required. The system has the following components: a parts bin; a flexible, program-controlled sorting unit; a video sensor for part recognition; a gripper for rotating the parts into the correct position; a program-controlled manipulator system with tactile sensors; program-controlled, positionable conveyor belts, a four-axis manipulator system for removal of cartoned parts and position controllers.

At the same location a freely programmable total assembly system is presently being set up. Using the simplest possible components, several assembly robots and conventional assembly stations will work together in such a manner that the system can be adapted to many varied tasks simply, rapidly and inexpensively.

A decisive step was taken with the further development of industrial robots from the blind-and-senseless first generation to the seeing-and-feeling second generation (Brown, Boveri and Cie, BBC) in which an optoelectronic measuring and sensing system (OMS) takes over, to a certain extent, functions of the natural eye. By means of a commercial video camera, it can recognize and measure objects in any angular position. By virtue of this feature the new system is suitable for optical inspection and for control of manipulating automats via a three-axis positioning device under microprocessor control. The entire system is then an optelectronic positioning system (OPOS) with which--somewhat modestly expressed--new avenues are opened for the realization of flexible feeder systems. In material-flow systems, after the parts have been fed-in and separated, it can reorient them into the position required for gripping. Only recently has a standard interface between optical sensors and the automat's control section become available, and the limits of application are still difficult to project.

One such system which was developed jointly by IPA and a screw manufacturer is being used for automatic visual inspection of screws. Noncontact measurement is effected with a universal optical sensor used in conjunction with a commercial video camera. The screws are separated and continuously moved through the picture field with illumination from the back. Any screw with incorrect length, diameter of thread is thrown out. (To be continued).

9160
CSO: 3102/315

BRIEFS

NORWEGIAN-FRG RESEARCH COOPERATION--(NORSK TELEGRAM BYRAA). Norway and West Germany will cooperate in nine research projects, which altogether will cost 95 million kroner. Of this amount, almost 59 million kroner will be used for research and development work in Norway. The funding will require 72 million kroner from Norwegian and West German public monies, and of that amount West Germany will cover 47 million kroner. The remainder of the costs will be handled from industry resources. The funding will mean a total transfer to Norway of about 20 million kroner in research funds. The cooperation is a result of two years of talks between the Ministry of Industry [of Norway] and the West German Ministry of Research and Technology. [Text] [Oslo AFTENPOSTEN in Norwegian 1 Jul 81 p 10]

CSO: 3102/327

BAE 146 TO KEEP UK IN WORLD CIVIL AIRCRAFT MARKET

Paris AVIATION MAGAZINE INTERNATIONAL in French 15-30 Jun 81 pp 32-33

[Article: "The BAe 146: A British Asset?"]

[Text] Photo caption: Without presenting any radical characteristics, the BAe 146 stands out due to the adoption of tried and tested technical solutions. This T-tail assembly, high-wing, four-jet aircraft may well fill a market which is very valuable but slow in emerging.

In Hatfield, on 20 May at noon, the first British Aerospace 146 left its assembly shop. The development of this 93-seat, four-jet, short-haul aircraft clearly demonstrates England's determination to maintain a full national production and marketing capability for civil aircraft, while also keeping a hand in cooperation, notably in Europe, through Airbus Industrie. But in order to pursue this twin policy, the national aircraft first has to be sold.

Once considered a passenger plane meant to bolster the British industry plan of attack, the HS-146, which has become the BAe 146, is now one of the assets on which Great Britain relies most heavily to keep its place in the civil aircraft market.

Marketing was off to a very slow start. At the time it left the plant, the BAe 146 had officially been selected by only one Argentine private company, LAPA (Lineas Aereas Privadas Argentinas), which in June 1980 had placed one firm order for three planes and taken an option on three more. This contract was estimated at 85 million dollars at the time.

On the eve of completion of the prototype, British Aerospace announced a new order, from Air Wisconsin, an American company, which signed a contract on 16 May for four planes and four options. The initial order is estimated at 70 million dollars. The first planes will be delivered to the American company in March 1983.

Another American group, Westair Holding Corporation, owner of two companies, Westair Commuter and Pacific Express Airlines, with which British Aerospace had been negotiating for several months, recently obtained agreement from its board of directors to place six planes on firm order and take an option on eight more.

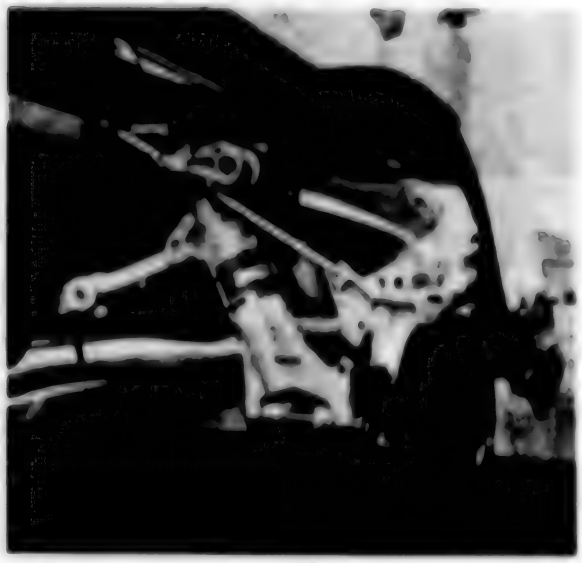
In all, there are therefore 13 firm orders and 15 options for the BAe 146.

The BAe 146 is highly lift-augmented, but its flap supports are markedly set back and have bulky fairing, even though the two inboard elements provide continuity for the jet-bearing struts. Note trim tabs and static balance horn on wingtips.

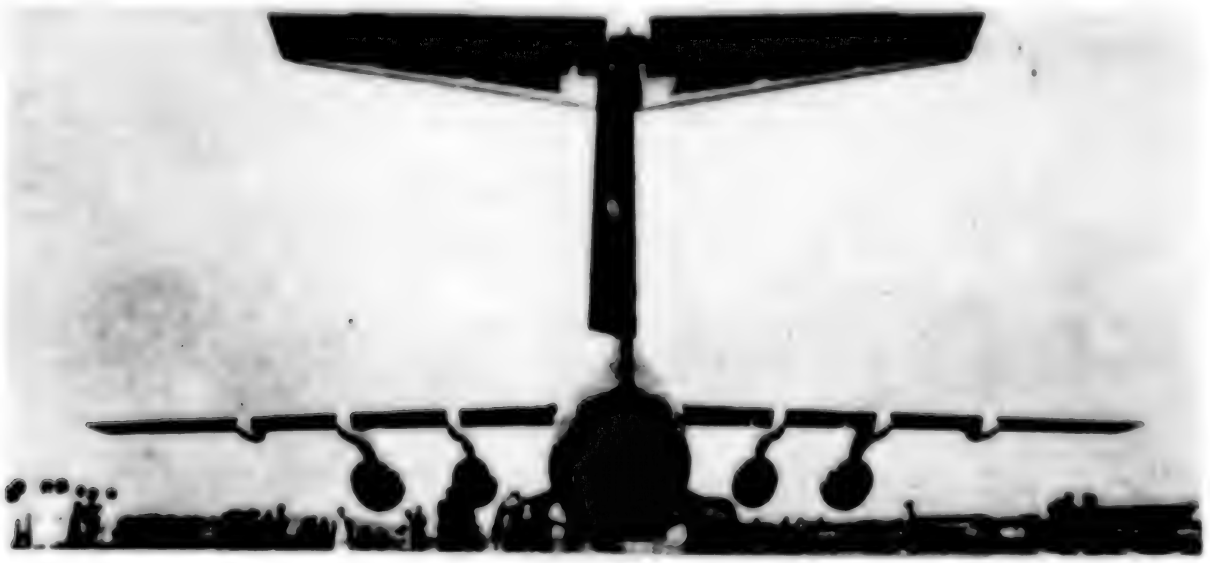
Three planes will be involved in the perfecting and certification procedure for the BAe 146. The first deliveries should occur in the summer of 1982, and three more will be scheduled for the following year.

It must be remembered that several non-British companies are involved in the program and its risks. Avco Corporation of Nashville is making the wing section and Saab-Scania of Linkoping, Sweden, is making the tail assembly.

Two versions of the plane are planned (see technical description in our issue No 785 p 42). The BAe 146-100 can carry 71 to 93 passengers depending on layout, and the slightly longer 200 can accommodate 82 to 109 passengers. The first BAe 146-300 will be the eighth to come off the assembly line in Hatfield, and initial deliveries of this model will take place in early 1983.



The main landing gear, with a retracted twin-wheel following the concept of "everything-inside-fuselage", offers a relatively limited track which will restrict the use of the craft under strong crosswinds. The tires are low-pressure.



This rear view of the aircraft shows details of the tail assembly, whose elevators and rudders are all equipped with trim tabs. Note arrangement of inboard flap guides, which do not seem as illogical in this view as in the first photo.

11,023
CSO: 3102/308

ATR 42: REGIONAL TRANSPORT DESIGNED FOR ECONOMY

Paris L'AERONAUTIQUE ET L'ASTRONAUTIQUE in French No 88, 1981-3 pp 19-22

[Article by P. Pebereau: "A Regional Transport Plane Designed for Fuel Economy: The ATR 42"]

[Text] Spectacular fuel cost increases and the introduction of deregulation in the United States have changed the situation of regional air transport in recent years and have brought turboprop planes back into the limelight. Major companies are showing increasing interest in these planes, on their own behalf or on behalf of their domestic traffic affiliates.

Faced with these developments, Aerospatiale began in 1977 to explore the idea of a turboprop small-capacity cargo plane. In 1978, these studies led to the initial stage of configuration research for a regional transport plane. In 1977, a second preliminary definition stage produced a deeper study leading to the definition of the AS 35. Finally, in 1980, the ATR 42 design resulted from a cooperation with Aeritalia, whose AIT 230 project was dictated by the same goals.

Among all the criteria considered in searching for a configuration adapted to regional air transportation requirements, one priority was set right at the start of the ATR 42 project: cost reduction, to be obtained through:

Design and production at minimum cost;

Beyond investment costs, reduction of operations expenses, particularly through energy savings.

It is this fuel-economy aspect of the ATR 42 project which we propose to discuss, first of all by summing up the main steps taken for that purpose, then by comparing the ATR 42 with various methods of regional transportation, all in terms of fuel savings.

Fuel Economy in ATR 42 Concept

The goal of fuel savings involves steps in the areas of aerodynamics, weight, engines, and propellers. Results of these steps for the ATR 42 are outlined in figure 1.

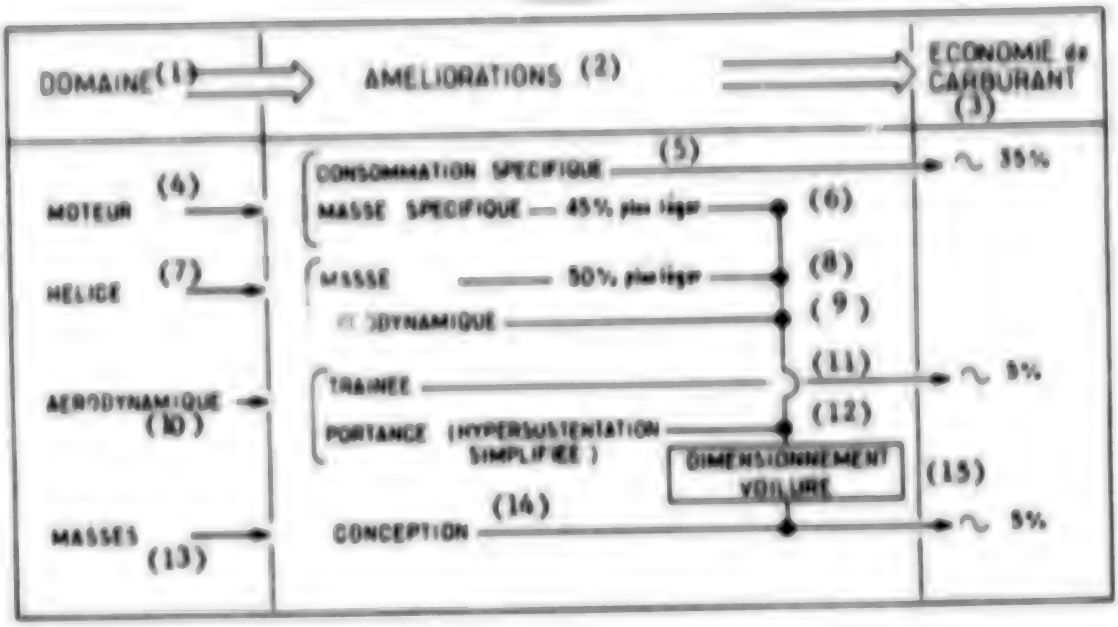


Figure 1. Technological Impact

Key:

1. Area
2. Improvements
3. Fuel savings
4. Engine
5. Specific consumption
6. Specific weight - 45 percent lighter
7. Propeller
8. Weight - 50 percent lighter
9. Aerodynamics
10. Aerodynamics
11. Drag
12. Lift (simplified lift augmentation)
13. Weights
14. Design
15. Wing dimensioning

Aerodynamics

Studies carried out over several years by Aerospatiale on subcritical modern profiles have produced an original ATR 42 profile offering the following characteristics:

Low drag;

High maximum lift making it possible to dispense with leading-edge lift-augmentation devices;

Low diving torque, resulting in reduced trim drag.

This profile, equipped with rotating, lift-augmented wing flaps (with fixed deflector), makes it possible to simultaneously attain the goals of low cost and reduced weight (simple kinematics), as well as high performance.

At the same time, special studies were conducted to find configurations which would improve the overall drag (karman, undercarriage fairing, pods.)

Finally, various applications of advanced technologies are planned, to further improve the fuel savings:

Local adaptation of wings to aerodynamic flow in propeller wake;

Optimization of wingtips;

Generalized active control.

Weight Reduction

This is obtained in particular through the use of modern composite materials in secondary structures and moving parts.

Engines

The ATR 42 is offered in a basic version with Pratt and Whitney of Canada PT7A-2R turboprops, an engine of recent design whose certification is expected in June 1983, and whose specific consumption is 20 to 30 percent less than that of turboprops presently in use, for a specific weight which is nearly 50 percent lower.

It will also be available with other engines under study by:

General Electric: CT7-9 which would be perfectly suited to the ATR 42 and would yield an estimated 7 percent savings on specific consumption compared to the PT7A-2R, but which is not yet definitely ready;

Turbomeca.

Propellers

The accepted propellers use a new design approach, benefitting from technological advances made at Hamilton Standard or Dowty Rotol:

Modern profiles which contribute improved low-speed efficiency and noise reduction;

Composite materials leading to 50 percent gains in overall weight.

Position of ATR 42 Compared to Various Regional Transportation Methods

Aerospatiale has conducted an in-depth comparative study of the various kinds of regional transports in terms of energy consumption. The results of this study are shown in figure 2 which gives, as a function of straight-line airport distances between two points, the oil equivalent grams (gep) per passenger-kilometer transported (pkt) as well as door-to-door times.

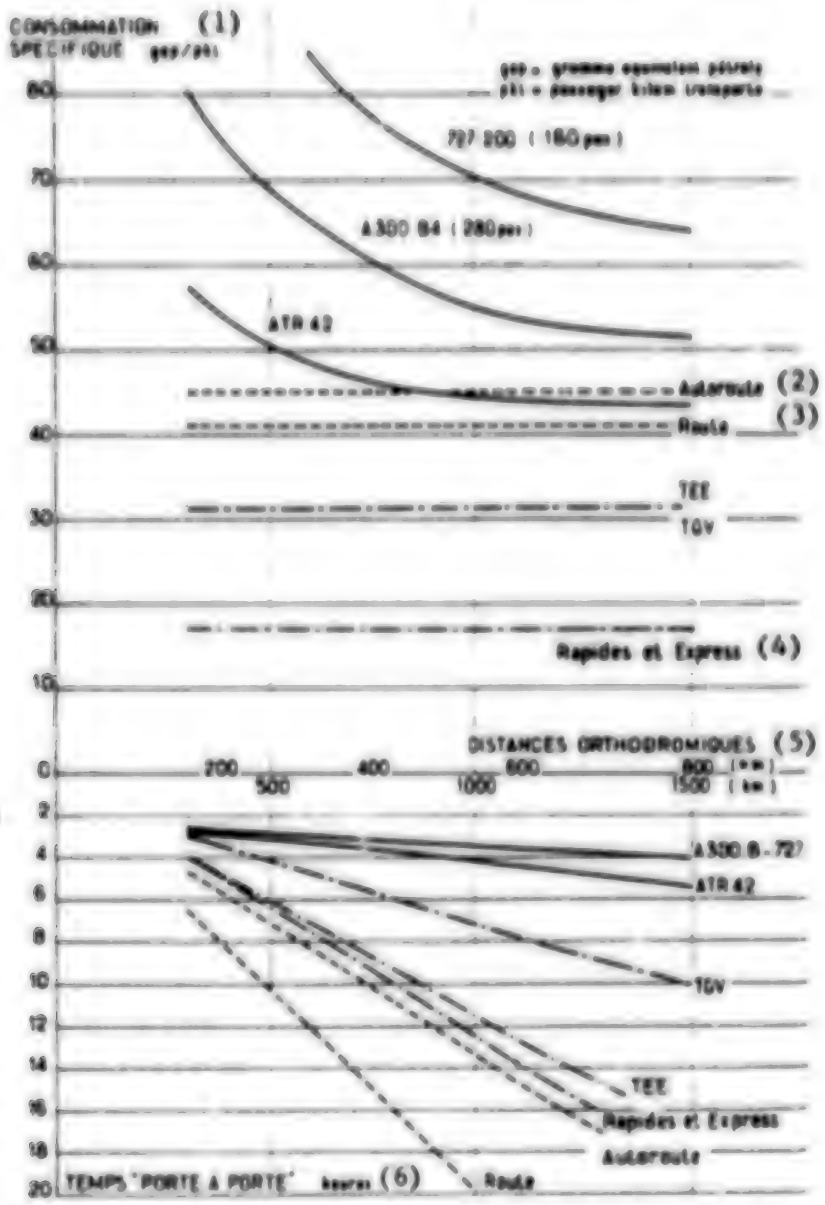


Figure 2

Key:

1. Specific consumption
2. Freeway
3. Road
4. Rapid and express transit
5. Straight-line distances
6. Door-to-door time - hours

These curves take into account various hypotheses for each type of transport, concerning:

Real distances covered with respect to straight-line distances;

Full speeds;

Additional delays attributable to travel time (city-airport or city-freeway, loading and unloading delays);

Loading coefficients.

This study brings out the fact that strictly from the point of view of specific consumption, railways are still the most economical by far. However, planes specially conceived for regional transport, such as the ATR 42, are relatively economical given the advantages they offer. The ATR 42 does not consume more than an average car on the freeway for distances over 300 km. If on the other hand travel time lapsed is taken into account, it should be remembered that a one-day business trip cannot be reasonably undertaken beyond a radius of 200 to 300 km on the freeway, or 300 to 400 km via rapid or express transit, or 400 to 600 km via TGV (high-speed train), while a plane can cover distances of up to 1500 km, in addition to which it is free of any natural obstacles.

Position of ATR with Respect to Competition

This comparison excludes turbofan planes which are penalized in terms of energy savings by the high specific consumption of their engines. Figure 2, however, indicates the position of the ATR with respect to the 727 or the Airbus.

Figure 3 shows, for a flight of 200 nm, the fuel savings of the ATR 42 against competing planes in the 30-50 seat range currently in production, newly launched, or in the planning stage. To make the comparison, we selected the basic version of the ATR 42 (42 passengers at 32" spacing).

The documentation for newly launched or projected planes was taken from press articles published about them.

The comparison discloses the following:

ATR consumes less than 50 percent of the fuel required by planes of the previous generation;

The craft is remarkably well positioned with respect to its competition in terms of consumption per available seat;

Particularly against planes of the same generation, DHC8, EMB 120, SF 340, with comparable engine technology, the ATR 42 retains a 15 to 20 percent advantage.

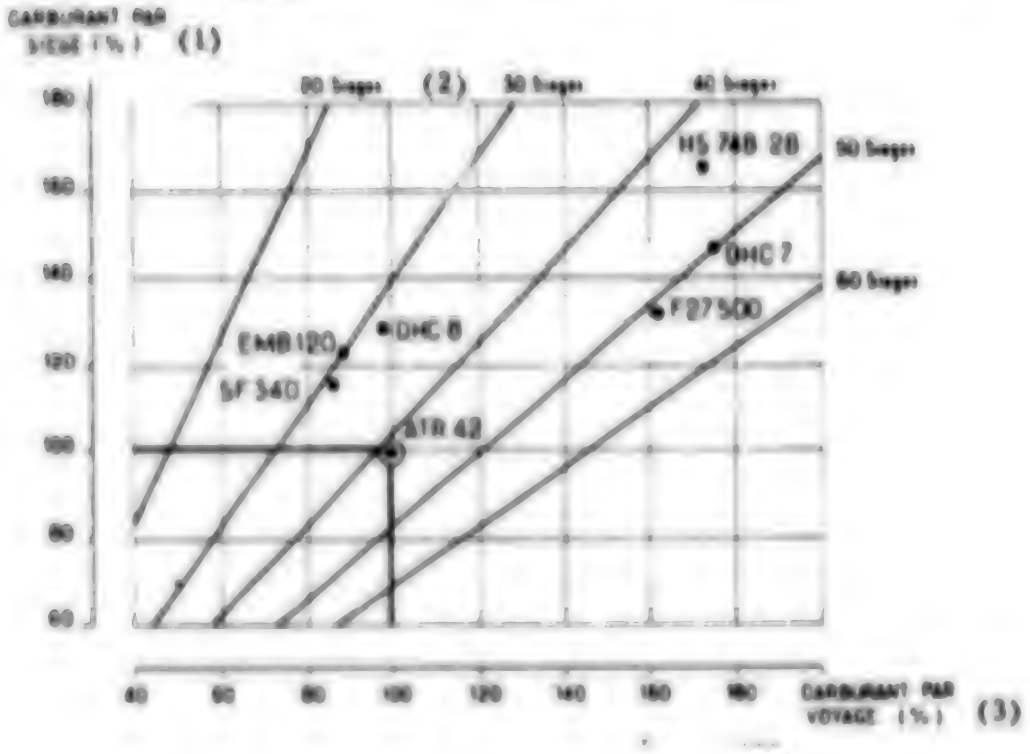


Figure 3. Comparative consumption per seat. Distance of 200 nm.

Key:
1. Fuel per seat (percent)
2. Seats
3. Fuel per flight (percent)

Future of Turboprop Planes

These few comparisons show the advantages of the ATR 42 in terms of economy for the basic version (42 passengers at 32" spacing); these advantages are further enhanced in the economy version (46 passengers at 30" spacing). But the ATR 42 is only the first step in a new line of very economical turboprop planes.

Even now, a lengthened version is planned, to bring capacity to 54 passengers at 34" spacing, and 58 passengers at 30". The plane's structures were conceived for this extension from the very beginning, and the engine power will be increased after placement in service (Pratt and Whitney of Canada is already offering a power increase of over 30 percent with the PT7 A 2R/1).

Engines using modern technologies, in the 5000-7000 hp, may become available by the end of the 1980's.

At the same time, propellers are being improved: high-performance propellers already make it possible to equip planes reaching a mach number of the order of 0.65.

Engines and propellers could thus make it possible to envisage, toward the end of the 1980's, airplanes capable of carrying 80-1000 passengers at relatively high speeds.

Fuel savings achieved in this way with respect to turbojets, amount to 30-50 percent depending on the speed under consideration.

Finally, Aerospatiale is engaged in exploratory studies with propfans, that is, with planes whose propellers can reach of mach number of nearly M = 0.8.

An important feasibility program is underway, aimed particularly at the following: propeller aerodynamics and structure, propeller-wing interaction, and cabin noise level, which would be unacceptable without special handling.

The problems to be resolved are major and difficult, and their solution cannot be anticipated for industrial application before the 1990's.

11,023
CSO: 3102/309

RENAULT DELIVERS FIRST EVE PROTOTYPE TO ENERGY AGENCY

Paris LE MATIN in French 20 Jun 81 p 16

[Article by Philippe Hazan: "Renault's EVE: 68.9 miles per gallon"]

[Text] Yesterday, Renault formally delivered its first EVE (Element for an Economic Vehicle) rolling laboratory to the Agency for Energy Conservation. The car was ordered in July 1979. With a mileage of 68.9 miles to the gallon, it is remarkable for its aerodynamic quality.

Almost 2 months later than Peugeot's VERA, Renault delivered yesterday to Jean Poulit, Director of the Agency for Energy Conservation, the first prototype of its EVE. This laboratory on wheels (two of which have already been manufactured) is not, as is the case with VERA, a variation on an existing model (the Peugeot 305 for VERA). It is a true prototype designed as such (in spite of some technical similarities with the R18) and whose initial objective is research on fuel economy. Another difference with VERA is that Renault's engineers at the Billancourt factory have deliberately decided not to tamper with the intrinsic characteristics of the power plant, which is that of the R5 GTL, or to make very serious attempts at weight reduction, since they were handicapped by the overdimensioning of existing parts. On the other hand, a considerable effort was made in the area of aerodynamics research, since numerous tests at the Saint-Cyr-l'Ecole wind tunnel have resulted in a .239 drag coefficient (CX) which is up to .318 on the VERA, although it must be noted that VERA is a modified production vehicle. Esthetically, EVE is quite different and the inside space is about the same as in a R18. Tests at the Montlery track have yielded a consumption of 51.83 miles per gallon at 74.75 mph (Renault claims 51 mpg), and 74.34 mpg at 55.55 mph. These figures therefore correspond to the standards verified by UTAC at the request of Renault and the Agency for Energy Conservation. It is interesting to note that whereas VERA's performance characteristics were improved, EVE's were reduced as compared to an R18 TL or GTL except for the maximum speed which goes to 97.56 mph from 93.21 mph. It is unfortunate that we were unable to test drive the car to try its road-handling characteristics since it seems that the microprocessor control (which improves mileage by instantaneously selecting the gear ratio and throttle setting at all times) makes handling touchy at first. Renault is now working on a second generation EVE which will be equipped, among other things, with an optimized diesel engine. Meanwhile, Renault is planning to put on the market in the near future a turbo-diesel Renault 30--While we wait for the new R9!

6445
CSO: 3102/318

AIRBUS INDUSTRIE HEAD DISCUSSES CONSORTIUM'S FUTURE

Paris L'USINE NOUVELLE in French 28 May 81 pp 52-54

[Interview with Bernard Lathiere, managing director of the Airbus Industrie consortium, by Antoine Thiboumery and Alain Pauche. Date and place not specified.]

[Text] Bernard Lathiere, 52 years old and managing director of the Airbus Industrie consortium for the past 5 years, wants to double Airbus' success. Five hundred planes will be sold this year, and 1,000 during the next, he predicts. What counts now for this likeable man, who frequently refers to his provincial roots and his village in the Haute-Vienne, is reaching the stage of 2,000 airplanes! "It's my main objective," he tells L'USINE NOUVELLE. Reappointed as managing director for another 5-year term, Bernard Lathiere broadly surveys the European and international aviation industry and reveals his strategy for the new airbuses at a time when the 34th International Air and Space Exhibition is opening next week at le Bourget (June 4-14).

[Question] Have you noticed an important change in the aircraft industry?

[Answer] Yes, there have been two major developments, which in fact tend to lead to opposite effects. First of all, we have become the second builder of commercial aircraft in the world, following Boeing. We have passed McDonnell Douglas and Lockheed! In most of the big contracts, it comes down to us and Boeing. Recently, for example, we have signed three contracts in the Middle East, and the last competitor we had to beat was in fact Boeing, with the 767.

The second development is that it is now the customer who is coming to us. This is a basic change for us. Boeing knows that its main competitor is no longer McDonnell Douglas or Lockheed, but Airbus Industrie.

[Question] Aren't you afraid of being the cat's paw for Boeing?

[Answer] No, because companies are now very careful about the overall cost of a plane. The Airbus was sold to Lebanon, for instance, because this plane is found in most countries in Asia and Europe, whereas the Boeing 767 is clearly not as widespread!

[Question] In the United States, doesn't this argument work against you in the end?

[Answer] That's true. Despite this, Eastern Airlines chose our plane in the United States simply because it is more economical than the Boeing. All the same, it seems that today's market is distributed as follows: the U.S. market is still dominated

by American companies; in Europe, Airbus Industrie has the edge; and, finally, the Third World is open to all companies. But I should stress the fact that we are in a relatively good position in these regions.

[Question] Are you currently affected by the air transportation crisis?

[Answer] No, absolutely not. Moreover, the air transportation crisis is not an economic crisis per se. It is a financial crisis: if the number of air passengers has not declined and if airlines' business continues to grow, then it is the income per passenger that has decreased. What are the reasons for this decline in the rate of return? First, fierce competition (deregulation, as the Americans say) has led to an abnormal reduction in fares. At the same time, the cost of fuel and personnel have been constantly on the rise. Today, for example, fuel accounts for 40 percent of a company's costs. A few years ago, it was only barely 10 percent! This trend was in our favor in the beginning: when fuel costs run too high, we have to change planes.

This is partly why we sold more than 200 Airbus A-300 in 1979. The crisis, however, has not always played in our favor. The Swedish airline SAS, for instance, recently cancelled two options. Others have asked us to delay delivery of their aircraft by 6 months to 1 year.

[Question] Haven't the airlines changed their strategy? It seems that they are now choosing more small-capacity planes than the large carriers?

[Answer] That's right. Just 2 years ago, all the airlines wanted us to build a large Airbus, an elongated A-300 with a capacity close to the DC-10, i.e. 320 to 350 seats. Today, the trend has reversed. They are attracted by smaller planes. So we are happy to offer them the A-310.

[Question] You recognize the importance of being able to offer two different planes, the A-300 and the A-310. But don't you think that your line is a little skimpy all the same?

[Answer] That's one of our basic policy aims, to have a full line.

[Question] More specifically, how is the Airbus Industrie line going to develop? Are you going to launch a large four-engine Airbus first, or a small twin engine craft?

[Answer] Let me remind you that we were the first in Europe to have realized the need to build a family around the Airbus. Just the opposite was done with the Caravelle! We have the A-300 with 250 seats and the A-310 with 210 seats. At the same time we have been working on three new designs for the past few years.

Let me clarify things. The issue is not which of the three we are going to build. We will make all three planes! The issue rather is which of these three planes we will decide to manufacture first.

First, we are studying an elongated version of the Airbus. It will be christened the TA-9. It will be a long to medium range plane equipped with two engines and not with three like its competitors. It will carry 320 passengers and 30 containers, or as much as a Boeing 747! This airplane is going to make our competitors unhappy: operating costs will be 25 percent less than for the three-engine jet now in service.

Then we have on the drawing boards a four-jet engine long-haul aircraft with 200 seats, the TA-11, with the same body as the A-310. This plane is different from the Boeing 747. It will be equipped with CFM 56 type engines, with 10-12 tons thrust. But we are also ready to equip it with the equivalent Pratt and Whitney or Rolls Royce engines. Whatever happens, two things are sure: we can build these two planes with the same wing, which obviously means substantial savings, and we will be launching them at the same time.

[Question] You spoke of a third plane?

[Answer] The third is the one everyone is talking about, the A-320. We are planning two versions: the A-320/100 and the A-320/200. The first will have a 143-seat capacity and the second 163 seats. So this plane will not in any way be competing with the Boeing 737, but with the Boeing 727 instead. Here we have a clear competitive edge since, with two engines, we can transport 15 to 20 passengers more than the Boeing 727!

[Question] What do the airlines think of this?

[Answer] The airlines seem to be interested more in the smaller planes than the larger ones. Our decision is in fact in their hands. If three or four companies are ready to make a commitment with us to be the first to buy either the A-320/100 or the A-320/200, that's the one we will launch. If, however, their choice runs to the TA-9, TA-11 pair, that is what we will make.

The choice of the companies to introduce the planes is crucial. We must in fact find a good formula which will enable us to achieve a sufficiently broad coverage of the market. What good is it to make a single plane for one airline, as was frequently done in the past?

[Question] On the issue of engines, don't you think that you could favor or give preference to the CFM 56 engines, since they are manufactured jointly by SNECMA [National Aircraft Engine Study and Manufacturing Company] and General Electric?

[Answer] It is not our business to sell SNECMA-General Electric engines. Our business is selling airplanes. Of course, if our customer should want French-American made engines besides, we would be delighted. But that is not our primary concern. On the contrary, in order to sell planes, you have to offer a maximum choice to the airlines. This means that you should be neutral in the choice of engines. Up to now, it has always been this way.

[Question] What is your objective in launching these four new airplanes?

[Answer] Our aim in increasing the Airbus line is to double the odds! About 40 airlines have currently ordered the Airbus A-300 and A-310 from us. In both firm orders and options, this represents more than 469 planes. We should exceed the target of 500 this year. Taking into account the lifespan of the A-300 and the A-310 and the airlines' needs, we know that we should sell a total of more than 1,000.

[Question] You could thus repay the money loaned by the governments?

[Answer] For the A-300, government loans will be fully reimbursed with the delivery of the 360th aircraft. We are delivering the 135th at present, and as soon as we finish the 150th, repayments will amount to $3 million a plane. In fact, we began repayments with the delivery of the first airplane. This is proof that Airbus will not be in a deficit position.

[Question] What is the budget for launching the A-320?

[Answer] Between $1 and $1.5 billion in research and development. You will recall that the A-310 cost $1 billion.

[Question] When will you decide to launch this new program?

[Answer] The management of Airbus Industrie must first submit its choice to the broad of trustees. If it's approved, the governments involved will be solicited to obtain the necessary financial aid. Our target is to bring the new plane out towards the end of 1985 or the beginning of 1986. This means that we will have to make our choice before the end of this year. Our decision should be made by the board around next September or October.

[Question] Will the division of responsibilities among the partners be the same?

[Answer] There is actually a good chance that the division of labor will be different from what it was for the A-300 and A-310.

[Question] Is it true that the Germans have reservations? And aren't you afraid that the consortium which worked so well for the first two programs might break up?

[Answer] A lot has been said and written to the effect that the Germans are not interested in the new program. This is completely untrue! What is true, however, is that they will probably not participate to the tune of 37.9 percent as they did before.

In that case, it is possible that the English, who currently have 20 percent, will increase their share. Aerospatiale may likewise ask for a larger share. It now has 37.9 percent.

[Question] Who will manufacture the wing? Who will handle the final assembly? Who will make the frame?

[Answer] This is of no importance from an economic standpoint (only from a chauvinistic one). Personally, I could not care less whether the assembly line is in France, England, or Germany.

[Question] All the same, you are obviously aware of the impact of this!

[Answer] Since I have been at Airbus, one of my main efforts has been to keep this airplane from becoming political, because political planes never take off!

[Question] You would leave the choice up to the firms?

[Answer] At the present time, Aerospatiale is handling the final assembly at Toulouse. Will it continue with the assembly, or would it prefer to work on the aerodynamics of the wing span, which is an equally important job but one at which it has less experience than the English? There is no obvious answer. In the same vein, would the English prefer to continue specializing in the aerodynamics of the wing span, a speciality which they would lose if they opt for the assembly? The important thing is for each one to have a sufficient workload.

[Question] Is it true that you have contacted the Japanese? Could they join the Airbus Industrie consortium?

[Answer] It is true that we have begun negotiations with them. But these negotiations have not progressed very far.

[Question] What is your purpose in contacting the Japanese, since their aviation industry lags behind the European's?

[Answer] You are right. Their industry is not at the same level as the European industry, but it is not as backward as people say. They can offer us many things. First, relatively low production costs and organizational know-how.

In fact, we are holding discussions with a group of industrialists which already has a 15 percent share in the manufacture of the Boeing 767! In short, what we are looking for with the Japanese is a long-term marriage.

[Question] Are you also interested in a cooperative arrangement with the Americans?

[Answer] With the Americans, it's more difficult. They have not yet exactly understood what we mean by a cooperative arrangement. They thing we're talking about subcontracting.

[Question] What could a cooperative arrangement with the Americans offer you? In any case, you couldn't be thinking of Boeing?

[Answer] That would raise a general outcry! But there are other aircraft companies in the United States. What we could expect from a cooperative arrangement with an American firm such as General Dynamics, for example, is an opening on the overseas Atlantic market. It's an enormous advantage to have an American company among your associates.

[Question] Let's come back to production aspects. Aren't you a little disappointed to see Airbus' production rate increase so slowly?

[Answer] It's true that production is increasing at a rather slow pace. But we can't do anything else. If we were to step up our delivery schedule--and we could of course decide to do this tomorrow--this could affect the quality and reliability of our aircraft, which would be catastrophic. If we are in fact able to hold our own vis-a-vis the three companies which have most of the world market, it is because our product is better than theirs. We have to keep this up. We are in any case going to quintuple the production rate in a few years from two to ten planes a month!

Today Airbus Industrie gives jobs to less than 15 percent of its partners' employees, or about 20,000 persons, whereas the total is about 160,000. By 1985 there will be 40,000 to 45,000 employees working on Airbus. At that time, the production rate will be ten planes a month. That will represent nearly 25 percent of the total staff of the consortium.

In summary, if you want to maintain a high quality, you cannot increase your personnel too much.

[Question] Should we conclude that Airbus Industrie doesn't have the means to make products other than those we see today? Doesn't this also mean that a military version of Airbus will not be appearing anything soon?

[Answer] You know, we are just barely able to produce a sufficient number of commercial aircraft. If we had to produce 50 military planes as well! No, I think wisdom dictates that we maintain our original goals.

[Question] What is Airbus Industrie's current market share and what position do you intend to have in the future?

[Answer] If you look only at that segment of the market covering the medium-range wide-bodied planes such as the DC-10, the Lockheed 1011 and to a certain extent the Boeing 767 and even the 747, our position a little more than a year ago was between 51 and 52 percent. For this year, we should end up around 49 to 50 percent. We therefore have about one-half of the market.

Overall, we already controlled 21 percent of the market in 1979. What is important is that however you calculate our position, we always come out ahead of Lockheed and McDonnell Douglas combined. That was our goal.

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BRIEFS

CN 235 ORDERS BEGIN--A short time after having announced the launching of joint production of the CN 235 commuter airliner (AMI No 803, p 46) [Spanish] CASA and [Indonesian] Nurtanio have taken 54 firm orders and 18 options. [Text] [Paris AVIATION MAGAZINE INTERNATIONAL in French 1-14 Jul 81 p 17]

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DATE FILMED

July 30, 1981